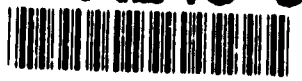
AD-A248 588



(2)

J PAGE	Form Approved OMB No 0704-0188

1. AGENCY USE ONLY (Leave blank)	2. REPORT DATE	3. REPORT TYPE AND DATES COVERED
	03/92	POP Test (2/92)

4. TITLE AND SUBTITLE

Performance Oriented Packaging Testing of Container, Shipping and Storage, Wooden, Mk 697 Mod 0 for Packing Group II Solid Hazardous Materials

5. FUNDING NUMBERS

6. AUTHOR(S)

James M. Dwyer

7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)

Naval Weapons Station Earle
Test and Evaluation Branch (Code 5023)
Colts Neck, NJ 07722-5000

8. PERFORMING ORGANIZATION REPORT NUMBER

DODPOPHM/USA/DOD/NADTR92002

9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)

Commander, Naval Surface Warfare Center
Indian Head Division
Indian Head, MD 20640-5000

10. SPONSORING/MONITORING AGENCY REPORT NUMBER

Same as above

11. SUPPLEMENTARY NOTES

N/A

12a. DISTRIBUTION/AVAILABILITY STATEMENT	12b. DISTRIBUTION CODE

13. ABSTRACT (Maximum 200 words)

Qualification tests were performed to determine whether the in-service Mk 697 Mod 0 Wooden Shipping and Storage Container could be utilized to contain properly dunnaged solid type hazardous materials weighing up to a gross weight of 143 kg (316 pounds). The tests were conducted in accordance with Performance Oriented Packaging (POP) requirements specified by the United Nations Recommendations on the Transportation of Dangerous Goods, ST/SG/AC.10/1 and the Code of Federal Regulations, Title 49 CFR, Parts 107 through 178. The container has conformed to the POP performance requirements; i.e., the container successfully retained its contents throughout the specified tests.

14. SUBJECT TERMS	15. NUMBER OF PAGES
POP Test of Mk 697 Mod 0 Wooden Shipping and Storage Container	7
	16. PRICE CODE

17. SECURITY CLASSIFICATION OF REPORT	18. SECURITY CLASSIFICATION OF THIS PAGE	19. SECURITY CLASSIFICATION OF ABSTRACT	20. LIMITATION OF ABSTRACT
UNCLASSIFIED	UL	UL	UL

DODPOPHM/USA/DOD/NADTR92002

PERFORMANCE ORIENTED PACKAGING TESTING OF CONTAINER, SHIPPING AND STORAGE, WOODEN, MK 697 MOD 0 FOR PACKING GROUP II SOLID HAZARDOUS MATERIALS

Author:
James M. Dwyer
Mechanical Engineering Technician

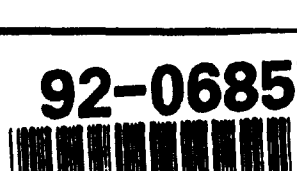
Performing Activity:
Naval Weapons Station Earle
Colts Neck, New Jersey 07722-5000

March 1992

FINAL

DISTRIBUTION UNLIMITED

Sponsoring Organization:
Commander
Naval Surface Warfare Center
Indian Head Division
Indian Head, MD 20640-5000



INTRODUCTION

This Performance Oriented Packaging (POP) test was performed to ascertain whether the Mk 697 Mod 0 Wooden Shipping and Storage Container (Packing Group II) meets the requirements specified by the United Nations Recommendation on the Transportation of Dangerous Goods Document, ST/SG/AC.10/1, Revision 6, Chapters 4 and 9 and the Code of Federal Regulations, Title 49 CFR, Parts 107 through 178, dated 1 October 1991. The container's contents consisted of one inert rocket motor section weighing 64.4 kg (142 pounds), and an additional 6.8 kg (15 pounds) of steel strapping material. Gross weight of the loaded container was 143 kg (316 pounds).

Due to unavailability only one container was used for testing. This is less than the number required by the regulations. Approval for this deviation has been granted by the Under Secretary of Defense, Memorandum for the Joint Logistics Commanders dated 22 February 1990.

TESTS PERFORMED

1. Base Level Vibration Test

This test was performed in accordance with Title 49 CFR, Part 178, Subpart M, Sec. 178.608. The container was placed on a repetitive shock platform which has a vertical linear motion of 1-inch double amplitude. Movement of the container was restricted during vibration in all but the vertical direction. The frequency of the platform was increased until the container lifted off the platform 1/16 of an inch at some instant during each cycle. Test time was 1 hour.

2. Stacking Test

This test was performed in accordance with Title 49 CFR, Part 178, Subpart M, Sec. 178.606. The container was subjected to a force applied to its top surface equivalent to the total weight of identical packages stacked to a minimum height of 3 meters (including the test container). A weight of 716.5 kg (1,580 pounds) was stacked on the test container. The test was performed for 24 hours. The weight was then removed and the container examined.

3. Drop Test

This test was performed in accordance with Title 49 CFR, Part 178, Subpart M, Sec. 178.603. Five drops were performed from a height of 1.2 meters (4 feet), impacting the following surfaces:

a. Flat bottom.

b. Flat top.

c. Flat on long side.

d. Flat on short side.

e. One corner.

PASS/FAIL

1. Base Level Vibration Test

The criteria for passing the base level vibration test is outlined in Title 49 CFR, Sec. 178.608(c): No test sample should show any deterioration which could adversely affect transportation safety or any distortion liable to reduce packaging strength.

2. Stacking Test

The criteria for passing the stacking test is outlined in Title 49 CFR, Sec. 178.606(d): No test sample may show any deterioration which could adversely affect transportation safety or any distortion likely to reduce its strength, cause instability in stacks of packages, or cause damage to inner packagings likely to reduce safety in transportation.

3. Drop Test

The criteria for passing the drop test is outlined in Title 49 CFR, Sec. 178.603(f): A package is considered to successfully pass the drop tests if for each sample tested, no rupture occurs which would permit spillage of loose explosive substances or articles from the outer packaging.

TEST RESULTS

1. Base Level Vibration Test

Satisfactory.

2. Stacking Test

Satisfactory.

3. Drop Test

Satisfactory.

DISCUSSION

1. Base Level Vibration Test

The input vibration frequency was 3.5 Hz. Immediately after the vibration test was completed, the container was removed from the platform, turned on its side and inspected. No damage, distortion, or deterioration was observed.

2. Stacking Test

The container was visibly checked after the 24-hour period was over. No distortion, or deterioration was observed.

3. Drop Test

After each drop, the container was inspected. The rocket motor was completely retained by the container.

REFERENCE MATERIAL

A. United Nation's "Recommendation on the Transportation of Dangerous Goods," ST/SG/AC.10/1, Revision 6.

B. Code of Federal Regulations, Title 49 CFR, Parts 107-178.

C. Bureau of Explosives Tariff No. BOE 6000K Hazardous Materials Regulations of the Department of Transportation by Air, Rail, Highway, Water including Specifications for Shipping Containers.

DISTRIBUTION LIST

Defense Technical Information Center (2 copies)
ATTN: DTIC/FDA
Bldg. 5, Cameron Station
Alexandria, VA 22304-6145

Defense General Supply Center (1 copy)
ATTN: DDRV-TMPA, D. Gray
Richmond, VA 23219

TEST DATA SHEET

DATA SHEET:	
Container: Mk 697 Mod 0 Wooden Shipping and Storage Container	
Type: 4D	Container P/N or NSN: 1340-01-118-2838
Specification Number: 53711-5167150	Material: Wood
Gross Weight: 143 kg (316 pounds)	Dimensions: 92" L x 14" W x 21-1/4" H
Closure (Method/Type): Steel strapping	Tare Weight: 72.1 kg (159 pounds)
Additional Description: 6.8 kg (15 pounds) of steel strapping material was secured to the test product	

PRODUCT:		
Name: See table	NSN(s): See table	
United Nations Number: See table		
United Nations Packing Group: II		
Physical State (Solid, Liquid, or Gas): Solid		
Vapor Pressure (Liquids Only): N/A	At 50 °C: N/A	At 55 °C: N/A
Consistency/Viscosity: N/A	Density/Specific Gravity: N/A	
Amount Per Container: 1	Flash Point: N/A	
Net Weight: See table		

TEST PRODUCT:	
Name: Dummy, 5" Rocket Motor	Physical State: Solid
Consistency: N/A	Density/Specific Gravity: N/A
Test Pressure (Liquids Only): N/A	
Amount Per Container: N/A	Net Weight: 64.4 kg (142 pounds)

TABLE 1
Products Approved for Shipping in the Mk 697 Mod 0 Wooden Shipping and Storage Container

NALC	NSN	Product Type	Packing Drawing	UN Code	UN Number	Units/ Cntr	Unit Weight (lb)
J143	1340-01-118-2838	Mk 22 Mod 4 Rocket Motor	5167150	1.3C	0186	1	142

MK 697 MOD 0
WOODEN SHIPPING AND STORAGE CONTAINER
POP MARKING

UN 4D/Y143/S/**/USA/DOD/NAD

** YEAR LAST PACKED OR MANUFACTURED

Encl (2)